What is claimed is:

1. An engine air-intake control device according to this invention includes:

a driving switch element that is connected in series to a motor, which controls an opening of an intake valve of an engine responsive to a detection output from an accelerator position sensor and a throttle position sensor, and controls a conduction current of said motor;

a power supply interruption element acting as a load circuit power supply interruption element connected to a power supply circuit of said motor, or as a control circuit power supply interruption element connected to a conduction controlling power supply circuit of said driving switch element;

a drive control circuit for generating a conduction drive output in order to control conduction to said driving switch element responsive to a detection output of said accelerator position sensor and throttle position sensor;

a monitoring control circuit that is connected via a serial communication circuit with respect to said drive control circuit, and monitors operation of said drive control circuit; and

status signal detection means for detecting an operation state of said driving switch element and said power supply interruption element, and for supplying a status signal corresponding to the operation state to said drive control circuit or said monitoring control circuit;

wherein said drive control circuit and monitoring control circuit cooperate with each other in accordance with a result of detection of said status signal detection means to generate

in a sharing manner a feed drive output in order to bring said power supply interruption element into operation, a feed-inhibit output in order to make said feed drive output reactive, and a conduction-inhibit output in order to make said conduction drive output reactive, whereby said outputs are caused to perform an operation stop or an operation permission of said power supply interruption element and said driving switch element.

2. The engine air-intake control device according to claim 1, wherein said load circuit power supply interruption element is a load relay comprised of a switch contact, which is connected in series to said motor, and an electromagnetic coil, which is controlled with said feed drive output and causes said switch contact to open and close;

the engine air-intake control device further comprising: a dummy load circuit formed of a resistor element and a diode, which energizes said driving switch element from a control power supply; and

in which a connection point electric potential between said resistor element and diode is supplied to said drive control circuit or said monitoring control circuit as a status signal for monitoring operation of said driving switch element.

3. The engine air-intake control device according to claim 2, further comprising: a closed-circuit detection circuit, which is brought into conduction due to closed circuit of the switch contact of said load relay;

wherein a generation voltage of said closed-circuit

detection circuit is supplied to said drive control circuit or said monitoring control circuit as a status signal for detecting operation state of the switch contact of said load relay.

4. The engine air-intake control device according claim 2, further comprising:

preceding turning-on means for making a conduction drive output active after a predetermined time period has passed from said feed drive output being active; and

delay interruption means for stopping a feed drive output or making a feed-inhibit output active after a predetermined time period has passed from stopping said conduction drive output or generating a conduction-inhibit output.

5. The engine air-intake control device according to claim 1, further comprising:

a power supply relay formed of a switch contact connected in series with respect to a power supply circuit relative to said motor, and an electromagnetic coil that is energized via a power supply switch and causes said switch contact to open and close; and

a control circuit power supply interruption element formed of a transistor that is brought into conduction in response to said feed drive output to close a controlling power supply circuit of said driving switch element;

wherein electric potential of said output circuit of the transistor is supplied to said drive control circuit or said monitoring control circuit as one of the status signals.

6. The engine air-intake control device according to claim 5, further comprising voltage-dividing resistors that divide voltage across said driving switch element, wherein a divided voltage provided by said voltage dividing resistors is supplied to said drive control circuit or said monitoring control circuit as one of the status signals.

7. The engine air-intake control device according to claim 1, wherein said drive control circuit generates a conduction drive output in order to perform an ON/OFF ratio control of said driving switch element responsive to a detection output from said accelerator position sensor and throttle position sensor and a feed-inhibit output in order to make a feed drive output, which said monitoring control circuit generates, reactive, and stops a conduction drive output when generating said feed-inhibit output;

said monitoring control circuit generates a feed drive output in order to act on said power supply interruption element and open/close a power supply circuit and a conduction-inhibit output in order to make a conduction drive output, which said drive control circuit generates, reactive, and stops a feed drive output when generating said conduction-inhibit output; and

said feed-inhibit output or said conduction-inhibit output is operated in a manner of self-diagnosis function and mutual diagnosis function by means of said drive control circuit and the monitoring control circuit.

8. The engine air-intake control device according to

claim 7, wherein the drive control circuit or monitoring control circuit to which said status signal is supplied, includes operation start permission means that compares a logic state of a status signal in each time step preliminarily stored with an actual logic state of a status signal in each time step, and stores non-coincidence as a result of comparison at the time of non-coincidence to continuously generate a conduction-inhibit output or feed-inhibit output; and

confirms that a feed-inhibit output circuit and conduction-inhibit output circuit function effectively, and thereafter stops respective inhibit outputs to make a feed drive output and a conduction drive output active at the startup of operation.

9. The engine air-intake control device according to claim 1, wherein said drive control circuit generates a conduction drive output in order to perform an ON/OFF ratio control of said driving switch element responsive to a detection output from said accelerator position sensor and throttle position sensor, and a feed drive output in order to act on said driving switch element, and open and close a power supply circuit;

said monitoring control circuit generates a conduction-inhibit output in order to make a conduction drive output reactive, which said drive control circuit generates, and a feed-inhibit output in order to make a feed drive output reactive, which said drive control circuit generates; and

said feed-inhibit output or a conduction-inhibit output is operated in a manner of self-diagnosis function and mutual

diagnosis function by means of said drive control circuit and monitoring control circuit.

10. The engine air-intake control device according to claim 9, wherein the monitoring control circuit 140c to which said status signal is supplied includes operation start permission means that compares a logic state of a status signal in each time step having been preliminarily stored with an actual logic state of a status signal in each time step, and stores non-coincidence as a result of comparison at the time of the non-coincidence to continuously generate at least one of a conduction-inhibit output and a feed-inhibit output; and

confirms that a feed-inhibit output circuit and a conduction-inhibit output circuit function effectively, and thereafter stops respective inhibit outputs to make a feed drive output and a conduction drive output active upon startup of the operation.

11. The engine air-intake control device according to claim 1, wherein said drive control circuit generates a conduction drive output in order to perform an ON/OFF ratio control of said driving switch element responsive to a detection output from said accelerator position sensor and throttle position sensor, a first conduction-inhibit output in order to make a conduction drive output reactive, and a feed drive output in order to act on said power supply interruption element and open and close a power supply circuit; and stops said feed drive output and said conduction drive output at the time of generating said first conduction-inhibit output;

said monitoring control circuit generates a second conduction-inhibit output in order to make a conduction drive output reactive, which said drive control circuit 110d generates; and

said first conduction-inhibit output and the second conduction-inhibit output are operated in a manner of self-diagnosis function and mutual diagnosis function by means of said drive control circuit and monitoring control circuit.

12. The engine air-intake control device according to claim 11, wherein the drive control circuit or monitoring control circuit to which said status signal is supplied includes operation start permission means that compares a logic state of a status signal in each time step having been preliminarily stored with an actual logic state of a status signal in each time step, and stores non-coincidence as a result of comparison at the time of the non-coincidence to continuously generate a first conduction-inhibit output or a second conduction-inhibit output; and

confirms that a first conduction-inhibit output circuit and a second conduction-inhibit output function effectively, and thereafter stops respective conduction-inhibit outputs to make a feed drive output and a conduction drive output active at the startup of operation.

13. The engine air-intake control device according to claim 11, wherein said monitoring control circuit generates a feed-inhibit output in order to make reactive a feed drive output which said drive control circuit generates.

14. The engine air-intake control device according to claim 13, wherein the drive control circuit or monitoring control circuit to which said status signal is supplied includes operation start permission means that compares a logic state of a status signal in each time step having been preliminarily stored with an actual logic state of a status signal in each time step, and stores non-coincidence as a result of comparison at the time of this non-coincidence to continuously generate a first and second conduction-inhibit outputs or a feed-inhibit output; and

confirms said first and second conduction-inhibit output circuits or a feed-inhibit output circuit function effectively, and thereafter stops respective inhibit outputs to make a feed drive output and a conduction drive output active at the startup of operation.

15. The engine air-intake control device according to claim 1, wherein at least one of said drive control circuit or the monitoring control circuit includes:

a microprocessor;

a watchdog timer that monitors a watchdog signal, which is a pulse train generated by said microprocessor, and generates a reset output pulse when a pulse width of said watchdog signal is larger than a predetermined value to cause said microprocessor to start up again; and

an error storage circuit, which stores therein that said reset pulse output has been generated or that number of reset pulse generations has reached a predetermined value to make at least one of said conduction drive output and feed drive

output reactive, and in which said storage state is reset when a power supply switch is turned on.

16. The engine air-intake control device according to claim 2, wherein at least one of said drive control circuit or the monitoring control circuit includes:

a microprocessor;

a watchdog timer that monitors a watchdog signal, which is a pulse train generated by said microprocessor, and generates a reset output pulse when a pulse width of said watchdog signal is larger than a predetermined value to cause said microprocessor to start up again; and

an error storage circuit, which stores therein that said reset pulse output has been generated or that number of reset pulse generations has reached a predetermined value to make at least one of said conduction drive output and feed drive output reactive, and in which said storage state is reset when a power supply switch is turned on.

17. The engine air-intake control device according to claim 5, wherein at least one of said drive control circuit or the monitoring control circuit includes:

a microprocessor;

a watchdog timer that monitors a watchdog signal, which is a pulse train generated by said microprocessor, and generates a reset output pulse when a pulse width of said watchdog signal is larger than a predetermined value to cause said microprocessor to start up again; and

an error storage circuit, which stores therein that said reset pulse output has been generated or that number of reset

pulse generations has reached a predetermined value to make at least one of said conduction drive output and feed drive output reactive, and in which said storage state is reset when a power supply switch is turned on.

18. The engine air-intake control device according to claim 7, wherein at least one of said drive control circuit or the monitoring control circuit includes:

a microprocessor;

a watchdog timer that monitors a watchdog signal, which is a pulse train generated by said microprocessor, and generates a reset output pulse when a pulse width of said watchdog signal is larger than a predetermined value to cause said microprocessor to start up again; and

an error storage circuit, which stores therein that said reset pulse output has been generated or that number of reset pulse generations has reached a predetermined value to make at least one of said conduction drive output and feed drive output reactive, and in which said storage state is reset when a power supply switch is turned on.

19. The engine air-intake control device according to claim 1, further comprising a comparison detection circuit that generates an over-current detection output when voltage across a current detection resistor, which is connected in series to an armature circuit of said motor, exceeds a predetermined value, and stores the operation of said over-current detection output to make at least one of said conduction drive output and the feed drive output reactive.

20. An engine air-intake control method implemented in the engine air-intake control device according to claim 1,

wherein the drive control circuit and monitoring control circuit carry out the operation stop or operation permission of said power supply interruption element and said driving switch element in a mutual sharing and cooperative manner in response to a status signal showing an operation state of the driving switch element that controls a conduction current of the motor and the power supply interruption element that switches a power supply of the motor or a power supply of the control circuit.